

# Development of an on-site Builder's estimating app for construction waste reduction

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**Published in:** [Computing Networking and Informatics \(ICCNI\), 2017 International Conference on](#)

**Date of Conference:** 29-31 Oct. 2017

**Date Added to IEEE Xplore:** 01 December 2017

**ISBN Information:**

**Electronic ISBN:** 978-1-5090-4642-3

**Print on Demand (PoD) ISBN:** 978-1-5090-4643-0

**INSPEC Accession Number:** 17413013

**DOI:** [10.1109/ICCNI.2017.8123770](https://doi.org/10.1109/ICCNI.2017.8123770)

**Publisher:** IEEE

**Conference Location:** Lagos, Nigeria

## Abstract:

Nigeria generated over 40 million tonnes of waste between the years 2005 to 2010, while construction waste generated on construction sites accounts for 15% of that proportion. One of the actors of the alarming high rate of construction waste has been attributed to poor estimation of materials on construction sites. The aim of this research was to develop an on-site Builder's estimating application for construction waste reduction. The study utilized the use of a questionnaire instrument and the system design of an offline estimating app. The questionnaire was distributed to fifty (50) professional Builders on construction sites. The Builders were selected through a convenience sampling technique. The data collected was analyzed using SPSS v.21. Statistical tools such as frequencies, percentages, mean scores and Kruskal Wallis H test were used to present the data. The builder's offline estimating app was developed using the Java script language. The study revealed that poor estimation can result into high wastage of building materials, over/under ordering of building material and overall cost overrun. The result indicated that Builders mostly used manual methods for estimating the quantities of building materials. Required per time. The most used manual methods includes the use of drawing specification, manual calculation and inference i.e. knowledge from previous construction works. The study revealed that there is no statistical significant difference in the factors influencing the choice of building materials estimating technique utilized on construction projects. In conclusion, a Builder's estimating application

was developed for the estimation of selected building materials on site in the required quantities. The study recommended that Builders should take advantage of the use of ICT in their construction activities. In addition, Builders should ensure that correct estimation of materials for construction works are done, as the inaccuracy in estimating building materials have dire consequences.

## I. Introduction

On a daily basis, the Nigerian building industry deals with dire challenges that have in one way or the other slowed the contributions of the sector. The industry has had to cope with the menacing scenarios of poor quality of buildings, overrun experienced in time and cost and client's dissatisfaction [1]–[4]. It has always being a surprise to construction clients, following a proper bill of quantity painstakingly prepared by a qualified Quantity surveyor during the planning stage of the project to control the cost of the project. Yet, this has not yielded the required result with evidence of cost overrun pervading the industry. [5] reported that presently 70% of construction projects experience time overrun, an increase of 14% average of contract cost (cost overrun) and waste generation of approximately 10% of material cost. These phenomena has been a great burden on clients in the construction industry.

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### Keywords

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[building material](#), [construction projects](#), [construction activities](#), [construction waste reduction](#), [construction sites](#), [poor estimation](#), [building materials](#), [on-site Builder estimating app](#), [on-site Builder estimating application](#), [mass 4.0E7 tonne](#)

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- **Author Keywords**

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[Builders](#), [Building Materials](#), [Estimating App](#), [Java Script Language](#), [Waste Reduction](#)